Restricted Circulation

This paper is not an official document; it is for information only and reference cannot be made to it in ay printed publication without the permission of the author.

Agricultural Memorandum No. 401

Monthly distribution of occurrences of heavy rains

M R ELVY & L P SMITH

The data from the 35 stations used in Ag Mems 395-400 are herein analysed irrespective of soil moisture status, on a monthly basis. The Appendix contains (for the period 1951-1960):-

Table 1. Occasions of 50 mm rain or more in 1 day
Table 2. " " " " " " " 3 days
Table 3. " " " " " " " 7 days
Table 4. Occasions of 75 mm rain or more in 3 days
Table 5. " " " " " " " 7 days
Table 6. Occasions of 100 mm rain or more in 7 days
Table 7. Monthly percentages of occurrences, 50 mm or more in 7 days, arranged in 6 areas.

Table 7 shows that the month most liable to produce periods of heavy rain varies with area. The maximum monthly percentages occur as follows:-

North - August
Midlands - November (but note also the high percentage in June, absent in other areas)
East - September
Southeast, Southwest & Wales - November

The seasonal distribution of percentages is as follows:

	Spring	Summer	Autumn	Winter
North	7	31	37	25
Midlands	11	36	38	15
East	6	34	48	12
Southeast	5	25	42	28
Southwest	11	17	41	31
Wales	10½	19½	40	30

There is more consistency when low rainfall areas are separated from those of high rainfall (750 mm or more annual average):-

Low Rainfall (below 750 mm)

	Spring	Summer	Autumn	Winter
North & Midlands	10	43	35	12
East & Southeast	5	35	45	15
Southwest & Wales	7	17	49	27
Total	7	35	41	17

High Rainfall (750 mm and above)

	Spring	Summer	Autumn	Winter
North & Midlands	8	26	39	27
Southeast	5	21	42	32
Southwest & Wales	11	19	39	31
Total	10	21	40	29

G.13336/EGP/9/71/60

Wet periods of 7 days are clearly more of a summer phenomena (and probably due to one or two heavy storms) in the drier areas but even so are relatively absent in the west of Britain in that season.

The monthly distributions, analysed in this way are as follows:-

Month	Low Rainfall	High Rainfall
January	6	10
February	2	6
March	2	4
April	1	2
May	4	4
June	9	4
July	5	6
August	21	11
September	11	10
October	11	12
November	19	18
December	9	13

Any comments or suggestions on this paper should be referred to the Authors.

Meteorological Office
Bracknell
Berks

September 1971.

TABLE 1

Values of No. of Occasions of 50 mm rain in 1 day: 1951-1960

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year
NORTH													
York (627 mm)	-	-	-	-	-	-	-	-	-	-	-	-	0
Durham (668)	-	-	-	-	-	-	-	-	-	-	-	-	0
Wakefield (670)	-	-	-	-	-	-	-	-	-	-	-	-	0
Cockle Park (729)	-	-	-	-	-	-	1	-	-	-	-	-	1
Carlisle (815)	-	-	-	-	-	1	-	-	-	-	-	-	1
Bradford (853)	-	-	-	-	1	-	-	1	-	-	-	-	2
Ruthwell (937)	-	-	-	-	-	-	-	-	-	-	-	-	0
Settle (1188)	1	-	-	-	-	-	-	-	-	-	-	-	1
MIDLANDS													
Cranwell (597)	-	-	-	-	-	1	-	-	-	-	-	-	1
Oxford (652)	-	-	-	-	-	1	-	1	1	-	-	-	3
Cheltenham (693)	-	-	-	-	-	1	-	-	-	-	-	-	1
Loughborough (715)	-	-	-	-	-	-	-	-	-	-	-	-	0
Birmingham (780)	-	-	-	-	-	-	-	-	-	-	-	-	0
Longton (837)	-	-	-	-	-	-	-	-	-	-	-	-	0
EAST													
Sheeburyness (516)	-	-	-	-	-	-	-	-	-	1	-	-	1
Cambridge (551)	-	-	-	-	-	-	1	-	-	-	-	-	1
Gorleston (607)	-	-	-	-	-	-	-	-	-	-	-	-	0
Sprowston (645)	-	-	-	-	-	-	-	-	-	-	-	-	0
Sandringham (691)	-	-	-	-	-	-	-	-	-	-	-	-	0
S.E.													
Kew (608)	-	-	-	-	-	-	-	-	-	-	-	-	0
E. Malling (683)	-	-	-	-	-	-	-	-	-	1	-	-	1
Hastings (739)	-	-	-	-	-	-	-	-	-	-	-	-	0
Andover (750)	-	-	-	-	-	-	-	-	-	1	-	-	1
Edenbridge (807)	-	-	-	-	-	-	-	-	2	1	-	-	3
Compton House (963)	-	-	-	-	-	-	1	1	-	1	-	-	3
S.W.													
Taunton (744)	-	-	-	-	-	1	-	-	-	1	-	-	2
Street (765)	-	-	-	-	-	-	-	-	-	-	-	-	0
Bath (785)	-	-	-	-	-	1	-	-	-	-	-	1	2
Boaminster (1019)	-	-	-	-	-	-	1	-	1	-	-	-	2
St. Austell (1228)	-	-	-	-	-	1	-	1	-	-	-	-	2
WALES													
Llandudno (731)	-	-	-	-	-	-	-	-	1	-	-	-	1
Llanerchymedd (1024)	-	-	-	-	-	-	-	-	-	-	-	-	0
Cardiff (1069)	-	-	-	-	-	-	-	-	-	-	-	1	1
Newbridge (1127)	-	-	-	-	-	-	-	-	-	-	-	1	1
Lake Vyrnwy (1605)	1	-	1	-	-	-	-	-	2	1	-	1	6

TABLE 2

Values of No. of Occasions of 50 mm in 3 days: 1951-1960

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year
NORTH													
York (627 mm)	-	-	-	-	-	-	-	3	-	-	2	-	5
Durham (668)	-	-	-	-	-	-	-	3	1	1	2	-	7
Wakefield (670)	-	-	-	-	-	-	2	2	-	-	1	-	5
Cocklo Park (729)	-	-	3	-	2	-	4	1	-	1	-	-	11
Carlisle (815)	1	-	-	-	-	3	-	3	-	3	-	-	10
Bradford (853)	1	-	-	-	3	-	2	4	-	2	2	1	15
Ruthwell (937)	2	-	-	-	-	-	7	2	5	4	5	-	25
Settle (1188)	4	-	-	-	-	-	4	10	4	5	2	9	38
MIDLANDS													
Cranwell (597)	-	-	-	-	2	3	1	-	-	-	-	-	6
Oxford (652)	-	-	-	-	-	3	-	3	3	-	-	-	9
Cheltenham (693)	1	-	-	-	-	3	-	1	-	-	3	-	8
Loughborough (715)	4	-	3	-	-	2	-	-	1	-	-	2	12
Birmingham (780)	3	-	2	-	-	-	2	1	2	-	2	-	12
Longton (837)	2	-	1	-	-	4	1	1	-	1	2	-	12
EAST													
Shoeburyness (516)	-	-	-	-	-	-	-	-	-	3	-	-	3
Cambridge (551)	-	-	-	-	-	-	3	-	-	-	-	-	3
Gorleston (607)	-	-	-	-	-	-	-	1	1	2	-	-	4
Sprowston (645)	-	-	-	-	-	-	-	-	2	2	-	-	4
Sandringham (691)	-	-	-	-	-	-	-	-	-	-	-	-	0
S.E.													
Kew (608)	-	-	-	-	-	-	3	-	-	-	-	-	3
E Malling (683)	-	-	-	-	2	3	1	-	-	-	-	-	6
Hastings (739)	1	-	-	-	-	2	-	6	1	6	3	2	21
Andover (750)	-	-	1	-	-	-	-	-	1	6	4	-	12
Edenbridge (807)	-	-	-	-	-	4	-	2	8	4	3	-	21
Compton House (963)	3	1	-	-	2	-	5	7	3	8	11	8	48
S.W.													
Taunton (744)	-	-	-	-	-	3	-	-	1	7	5	1	17
Street (765)	-	-	-	-	-	-	-	3	-	2	2	-	7
Bath (785)	-	-	-	-	2	3	1	4	2	2	3	3	20
Beaminster (1019)	3	1	-	-	2	-	5	7	3	8	11	8	48
St. Austell (1228)	4	1	-	-	1	4	3	4	2	6	10	7	42
WALES													
Llandudno (731)	-	-	-	-	-	-	-	6	4	-	-	-	10
Llanerchymedd (1024)	2	1	-	-	-	-	2	7	3	5	3	1	24
Cardiff (1069)	-	1	-	-	-	1	1	6	9	4	8	3	33
Newbridge (1127)	2	2	5	-	-	3	-	2	5	4	1	3	27
Lake Vyrnwy (1605)	19	3	6	1	1	2	9	6	16	19	16	22	120

TABLE 3

Values of No. of Occasions of 50 mm in 7 days = 1951-1960

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year
NORTH													
York (627 mm)	2	1	-	-	6	-	7	29	2	-	14	-	61
Durham (668)	-	-	1	-	-	-	-	24	7	15	9	-	56
Wakefield (670)	9	3	-	-	5	-	7	19	2	4	12	1	62
Cockle Park (729)	1	-	11	3	6	-	14	34	5	14	16	8	112
Carlisle (815)	2	4	-	-	-	10	8	23	18	12	10	7	94
Bradford (853)	21	12	6	-	10	-	8	35	6	18	34	25	175
Ruthwell (937)	20	17	13	-	2	-	20	30	29	27	42	14	214
Settle (1188)	52	21	9	3	11	4	42	49	40	43	52	66	392
MIDLANDS													
Cranwell (597)	3	1	-	-	6	15	6	13	4	-	5	-	53
Oxford (652)	2	-	2	-	5	16	-	12	10	7	27	1	82
Cheltenham (693)	12	-	-	-	8	14	-	27	7	9	14	12	103
Loughborough (715)	8	3	7	4	-	12	-	14	14	5	14	11	92
Birmingham (780)	10	7	9	6	7	7	4	16	14	10	25	8	123
Longton (857)	4	3	6	-	5	21	13	16	14	17	29	6	134
EAST													
Shoeburyness (516)	-	-	-	-	-	6	2	4	13	10	5	1	41
Cambridge (551)	-	-	-	-	-	3	9	3	8	-	2	-	25
Gorleston (607)	1	-	-	4	4	6	5	9	6	14	5	5	59
Sprowston (645)	2	2	-	1	-	2	-	8	6	7	4	1	33
Sandringham (691)	-	3	-	2	-	-	-	5	3	-	5	5	23
S.E.													
Kew (608)	-	-	-	-	-	8	9	8	1	2	16	-	44
E. Malling (683)	3	1	-	-	6	15	6	13	4	-	5	-	53
Hastings (739)	13	4	4	-	-	5	1	29	11	29	50	29	175
Andover (750)	10	2	2	-	8	9	7	8	11	42	34	17	150
Edenbridge (807)	13	21	2	-	2	20	6	15	27	16	39	29	190
Compton House (963)	35	26	9	2	9	6	25	43	22	27	65	62	331
S.W.													
Taunton (744)	7	2	-	3	9	9	-	5	9	27	32	35	138
Street (765)	2	-	1	-	11	7	2	13	5	18	31	14	104
Bath (785)	4	3	1	6	10	20	4	33	13	22	32	15	163
Beaminster (1019)	37	22	13	9	13	10	16	21	32	45	73	61	352
St. Austell (1228)	61	38	24	9	23	18	13	37	28	57	72	78	458
WALES													
Llandudno (731)	13	4	6	-	-	6	-	22	27	6	22	7	113
Llanerchymedd (1024)	19	22	3	-	14	11	10	33	44	24	63	29	272
Cardiff (1069)	27	24	11	7	14	15	23	49	62	49	70	44	395
Newbridge (1127)	45	21	16	16	2	15	4	21	34	37	61	42	314
Lake Vyrnwy (1605)	103	57	39	33	40	29	70	66	80	66	100	101	784

TABLE 4

Values of No. of Occasions of 75 mm in 3 days: 1951-1960

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year
NORTH													
York (627 mm)	-	-	-	-	-	-	-	-	-	-	-	-	0
Durham (668)	-	-	-	-	-	-	-	-	-	-	-	-	0
Wakefield (670)	-	-	-	-	-	-	-	-	-	-	-	-	0
Cocklo Park (729)	-	-	-	-	-	-	-	-	-	-	-	-	0
Carlisle (815)	-	-	-	-	-	-	-	-	-	1	-	-	1
Bradford (853)	-	-	-	-	-	-	-	2	-	-	-	-	2
Ruthwell (937)	-	-	-	-	-	-	-	-	-	1	-	-	1
Settle (1188)	-	-	-	-	-	-	-	-	-	-	-	1	1
MIDLANDS													
Cranwell (597)	-	-	-	-	-	-	-	-	-	-	-	-	0
Oxford (652)	-	-	-	-	-	3	-	-	3	-	-	-	6
Cheltenham (693)	-	-	-	-	-	-	-	-	-	-	-	-	0
Loughborough (715)	-	-	-	-	-	-	-	-	-	-	-	-	0
Birmingham (780)	-	-	-	-	-	-	-	-	-	-	-	-	0
Longton (837)	-	-	-	-	-	-	-	-	-	-	-	-	0
EAST													
Shoeburyness (516)	-	-	-	-	-	-	-	-	-	1	-	-	1
Cambridge (551)	-	-	-	-	-	-	1	-	-	-	-	-	1
Gorleston (607)	-	-	-	-	-	-	-	-	-	-	-	-	0
Sprowston (645)	-	-	-	-	-	-	-	-	-	1	-	-	1
Sandringham (691)	-	-	-	-	-	-	-	-	-	-	-	-	0
S.E.													
Kew (608)	-	-	-	-	-	-	-	-	-	-	-	-	0
E. Malling (1683)	-	-	-	-	-	-	-	-	-	-	-	-	0
Hastings (739)	-	-	-	-	-	-	-	1	-	-	-	-	1
Andover (750)	-	-	-	-	-	-	-	-	-	1	-	-	1
Edenbridge (807)	-	-	-	-	-	-	-	-	1	1	1	-	3
Compton House (963)	-	-	-	-	-	-	-	-	-	-	1	-	1
S.W.													
Taunton (744)	-	-	-	-	-	1	-	-	-	-	-	-	1
Street (765)	-	-	-	-	-	-	-	-	-	-	-	-	0
Bath (785)	-	-	-	-	-	-	-	-	-	-	-	-	0
Beaminster (1019)	2	-	-	-	-	-	3	-	3	-	2	2	12
St. Austell (1228)	-	-	-	-	-	2	-	3	1	1	-	1	8
WALES													
Llandudno (731)	-	-	-	-	-	-	-	1	-	-	-	-	1
Llanerchymedd (1024)	-	-	-	-	-	-	2	-	-	-	-	-	2
Cardiff (1069)	-	-	-	-	-	-	-	-	-	1	-	-	1
Newbridge (1127)	-	-	-	-	-	-	-	-	1	-	-	3	4
Lake Vyrnwy (1605)	4	-	3	-	-	-	1	-	-	4	2	5	19

TABLE 5

Values of No. of Occasions of 75 mm in 7 days: 1951-1960

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year
NORTH													
York (627 mm)	-	-	-	-	-	-	-	7	-	-	4	-	11
Durham (668)	-	-	-	-	-	-	-	6	-	3	3	-	12
Wakefield (670)	-	-	-	-	-	-	-	4	-	-	2	-	6
Cockle Park (729)	-	-	1	-	-	-	1	11	1	3	4	-	21
Carlisle (815)	-	-	-	-	-	-	-	5	1	7	-	-	13
Bradford (853)	1	1	-	-	1	-	-	12	-	-	4	-	19
Ruthwell (937)	1	-	-	-	-	-	3	5	4	5	7	-	25
Settle (1188)	6	1	-	-	-	-	8	20	4	16	16	22	93
MIDLANDS													
Cranwell (597)	-	-	-	-	-	-	2	-	1	-	-	-	3
Oxford (652)	-	-	-	-	-	9	-	3	7	-	-	-	19
Cheltenham (693)	-	-	-	-	-	2	-	4	-	-	8	1	15
Loughborough (715)	3	-	3	-	-	2	-	-	5	-	-	-	13
Birmingham (780)	4	-	3	-	-	-	-	2	1	-	11	-	21
Longton (837)	2	-	-	-	-	3	1	3	-	4	9	-	22
EAST													
Shoeburyness (516)	-	-	-	-	-	-	-	-	1	6	-	-	7
Cambridge (551)	-	-	-	-	-	-	5	-	-	-	-	-	5
Gorleston (607)	-	-	-	-	-	-	-	-	-	-	-	-	0
Sprowston (645)	-	-	-	-	-	-	-	-	-	5	-	-	5
Sandringham (691)	-	-	-	-	-	-	-	-	-	-	-	-	0
S.E.													
Kew (608)	-	-	-	-	-	-	1	4	-	-	-	-	5
E Malling (683)	-	-	-	-	-	-	2	-	1	-	-	-	3
Hastings (739)	-	-	-	-	-	-	-	6	2	9	8	-	25
Andover (750)	-	-	-	-	-	-	-	-	-	12	11	-	23
Edenbridge (817)	-	-	-	-	-	1	-	3	8	9	15	-	36
Compton House (963)	1	8	-	-	-	1	4	9	4	7	26	13	73
S.W.													
Taunton (744)	-	-	-	-	-	5	-	-	4	13	12	-	34
Street (765)	-	-	-	-	-	-	-	4	-	4	7	-	15
Bath (785)	-	-	-	-	4	3	-	4	-	4	12	1	28
Beaminster (1019)	9	4	2	2	-	-	7	3	13	17	22	15	94
St. Austell (1228)	12	5	-	-	-	8	-	10	2	20	19	19	95
WALES													
Llandudno (731)	-	-	-	-	-	-	-	9	-	-	-	-	9
Llanerchymedd (1024)	1	3	-	-	1	1	3	12	4	6	10	4	45
Cardiff (1069)	1	3	-	-	2	1	7	2	7	18	18	7	66
Newbridge (1127)	8	5	8	3	-	7	-	3	16	5	14	12	81
Lake Vyrnwy (1605)	51	17	11	3	11	6	9	14	29	37	44	46	278

TABLE 6

Values of No.of Occasions of 100 mm in 7 days: 1951-1960

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year
NORTH													
York (627 mm)	-	-	-	-	-	-	-	2	-	-	-	-	2
Durham (668)	-	-	-	-	-	-	-	-	-	-	-	-	0
Wakefield (670)	-	-	-	-	-	-	-	-	-	-	-	-	0
Cockle Park (729)	-	-	-	-	-	-	-	2	-	-	-	-	2
Carlisle (815)	-	-	-	-	-	-	-	-	-	2	-	-	2
Bradford (853)	-	-	-	-	-	-	-	4	-	-	-	-	4
Ruthwell (937)	-	-	-	-	-	-	-	-	2	4	-	-	6
Settle (1188)	-	-	-	-	-	-	-	1	-	1	-	7	9
MIDLANDS													
Cranwell (597)	-	-	-	-	-	-	-	-	-	-	-	-	0
Oxford (652)	-	-	-	-	-	-	-	-	-	-	-	-	0
Cheltenham (693)	-	-	-	-	-	-	-	-	-	-	-	-	0
Loughborough (715)	2	-	-	-	-	-	-	-	-	-	-	-	2
Birmingham (780)	3	-	-	-	-	-	-	-	-	-	2	-	5
Longton (837)	-	-	-	-	-	-	-	-	-	-	1	-	1
EAST													
Shoeburyness (516)	-	-	-	-	-	-	-	-	-	-	-	-	0
Cambridge (551)	-	-	-	-	-	-	-	-	-	-	-	-	0
Gorleston (607)	-	-	-	-	-	-	-	-	-	-	-	-	0
Sprowston (645)	-	-	-	-	-	-	-	-	-	-	-	-	0
Sandringham (691)	-	-	-	-	-	-	-	-	-	-	-	-	0
S.E.													
Kew (608)	-	-	-	-	-	-	-	-	-	-	-	-	0
E. Malling (683)	-	-	-	-	-	-	-	-	-	-	-	-	0
Hastings (739)	-	-	-	-	-	-	-	1	-	-	3	-	4
Andover (750)	-	-	-	-	-	-	-	-	-	4	-	-	4
Edenbridge (817)	-	-	-	-	-	-	-	3	1	1	1	-	6
Compton House (963)	-	-	-	-	-	-	-	-	-	-	6	-	6
S.W.													
Taunton (744)	-	-	-	-	-	-	-	-	-	5	2	-	7
Street (765)	-	-	-	-	-	-	-	-	-	-	-	-	0
Bath (785)	-	-	-	-	-	-	-	-	-	-	1	-	1
Beaminster (1019)	3	-	-	-	-	-	7	-	8	7	10	6	41
St. Austell (1228)	-	-	-	-	-	-	-	7	-	5	5	4	21
WALES													
Llandudno (731)	-	-	-	-	-	-	-	-	-	-	-	-	0
Llanerchymedd (1024)	-	-	-	-	-	-	3	-	-	-	-	-	3
Cardiff (1069)	-	-	-	-	-	-	-	-	-	-	3	-	3
Newbridge (1127)	-	1	-	-	-	-	-	2	-	-	-	4	7
Lake Vyrnwy (1605)	22	5	4	3	-	2	2	2	6	13	21	29	109

TABLE 7

Values of Percentage Occurences of 50 mm in 7 days

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov	Dec.	Year
NORTH	9	5	3	1	3	1	9	21	9	12	16	11	
MIDLANDS	7	2	4	2	5	15	4	17	11	8	19	6	
EAST	2	3	0	4	2	9	9	16	20	17	11	7	
SOUTHEAST	8	6	2	0	3	7	6	12	8	12	22	14	
SOUTHWEST	9	5	3	2	6	5	3	9	7	14	20	17	
WALES	11	7	4	3	$3\frac{1}{2}$	4	$5\frac{1}{2}$	10	13	10	17	12	